



**Town of Amherst  
Department of Public Works**

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**SECTION 9**

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**BWP SW 11 landfills Major Modification Permit  
(Section 6 Beneficial Use Determination Risk Assessment)**

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## SECTION 6 RISK ASSESSMENT

### **PURPOSE**

The purpose of this risk assessment is to perform an evaluation of the risk of harm to health, safety, public welfare and the environment by disposal of arsenic contaminated soil, street sweepings and catch basin cleanings at the Old Amherst Landfill, Belchertown Road, Amherst, MA.

### **SCOPE AND METHODOLOGY**

The Old Amherst Landfill, Old Belchertown Road, Amherst, MA is the disposal site being evaluated in this Risk Assessment. Two types of contaminants, arsenic and road surface automotive contaminants are contained in the soils to be used as secondary material for regrading purposes at the Old Amherst Landfill. Since the contaminants are easily identifiable, primarily limited to soil and groundwater with minimal air exposure for humans and Method 1 standards exist for each contaminant, Method 3, a chemical/site-specific approach is used for the Risk Assessment.

Testing for contaminants in street sweepings is not normally required by MassDEP since levels of contaminants are low enough to permit use at Regulated Locations. However, it is generally accepted that the Constituents of Concern (COCs) contained in street sweepings are total petroleum hydrocarbons (TPHs) and polynuclear aromatic hydrocarbons (PAHs). MassDEP does not routinely require testing of catch basin cleanings unless there is evidence of contamination. The street sweepings and catch basin cleanings that the Town of Amherst is proposing to use as secondary material are collected from non-Urban Center roadways and do not originate in central commercial, industrial or manufacturing areas. No testing has been performed on these materials and risk of harm is not evaluated herein as the policies of the Massachusetts Department of Environmental Protection have generally concluded that there is very little risk of harm to human health, public welfare and the environment when these materials are disposed at a Regulated Location.

A *Final Comprehensive Site Assessment (BWP SW 23)* was submitted in January, 2009. Part of that submission included an FCSA Baseline Risk Assessment following MassDEP guidelines in the *Landfill Technical Guidance Manual, Revised May 1997*.

### **SITE DESCRIPTION**

The Disposal Site for the contaminated soils covered in this **APPLICATION FOR BENEFICIAL USE DETERMINATION (CATEGORY 2) – BWP SW 40** is the Old Amherst Landfill, Belchertown Road, Amherst, MA. The site is an unlined landfill that was closed and finally capped in 1988. The 52± acres consist primarily of open, grassed land generally sloping downward to the southeast. A pond borders a portion of the easterly side of the property. Although the access road to the site is gated and locked, local residents can access the site by walking





around the fences. *Section 3 – Site Description and History* of this submission sets forth a more detailed description of the site.

### **MIGRATION PATHWAYS**

Both types of contaminants, arsenic and trace amounts of road surface fuel oils, when disposed of at the Old Amherst Landfill, will be contained in soil media ranging from fine sediments to sandy loams and coarse sand. During construction activities, potential migration pathways include soil, surface water, air and sediments. Potential migration pathways after placement include soil and groundwater.

### **CONTAMINANT CHARACTERISTICS**

Arsenic is a relatively stable, ubiquitous and naturally-occurring metalloid. Arsenic naturally cycles through the environment and is constantly being oxidized, reduced or otherwise metabolized. Historically, arsenic was used medicinally and more recently in industrial and agricultural applications. Use of pesticides containing arsenic has been banned for food applications, but the residual effects of its use in this application continue to require remediation. Concentrations of arsenic can be found in orchards as well as in discharges of industrial wastes.

Routine testing completed for arsenic in the contaminated soil did not determine whether the arsenic was organic or inorganic. See *Section 5 – Beneficial Use Determination (BWP SW 40)* for details of the soil sampling and analysis. Although certain arsenic oxide compounds are soluble in water, most contamination settles in soils or sediments. Groundwater is far more likely to contain higher concentrations of arsenic than surface water. Arsenic used for agricultural purposes is not volatile although airborne exposure can occur with suspended particulates in dusty soil. Experimental data should not be the only tool used to evaluate the toxicity of arsenic since metabolism and toxicity varies greatly between species.

Arsenic is possibly the only chemical that is a known human carcinogen and whose carcinogenicity tests for animals are negative. Exposure to toxic doses of arsenic may cause humans and other mammals to manifest neurological disturbances, cardiovascular episodes, high blood pressure, central nervous system dysfunction and death.

Chronic exposure to arsenic can have significant health and environmental implications since it tends to be bioaccumulative. Its bioavailability depends on whether it occurs organically or inorganically, temperature and pH of soil or water. Certain plants and fungi absorb arsenic. Arsenic is bioconcentrated by organisms but it is not biomagnified in the food chain; it is readily excreted by humans and other mammals within a few days of exposure. Wildlife rarely succumbs to arsenicosis. Recent research has produced some evidence that minute amounts of arsenic can be beneficial to certain plants and animals.





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Limited data is available to determine long effects of arsenic to soil and other terrestrial and aquatic biota. Some organisms are capable of metabolizing high concentrations of arsenic while others show reduced growth and display teratogenic effects with exposure. Some aquatic and avian species show improved growth with exposure to arsenic. Plants can absorb arsenic and other research indicates that certain soil microorganisms are capable of tolerating high concentrations of arsenic.

### **RECEPTORS**

The list of current and future receptors was developed for this Risk Assessment based on 310 CMR 40.0900 Procedures and Standards for the Characterization of the Risk of Harm to Health, Safety, Public Welfare and the Environment as it relates to evaluation of risks posed by oil and/or hazardous material at disposal sites. The magnitude of each receptor's total exposure to the secondary material is calculated in a manner which provides a conservative estimate of potential exposure.

#### Human Receptors

Potential human receptors include construction workers, local residents and trespassers. Construction worker are adults age 18 years and over. Local residents and trespassers include adults, women of child-bearing age, and children ages 1 to 8 years.

#### Construction Workers

Currently employees of the Town of Amherst deposit snow during winter, mow fields during the growing season and perform minor site maintenance throughout the year. At most, a worker is present one to two hours per week, on average. During construction periods, up to three to four site workers may be present for a few days to several weeks at a time. Workers could be exposed to airborne arsenic if the contaminated soil is dusty. Skin contact would be minimal as most of the grading work will be accomplished with heavy equipment. After the fill material is placed and the site regrading complete, pre-construction maintenance routines will recommence. Possible harm to site workers during construction caused by exposure to contaminated soil is low.

#### Local Residents

The Old Amherst Landfill is surrounded by residential neighborhoods which are identified as potential receptors of possible harm caused by deposition of contaminated soil at the Old Amherst Landfill. The general public is not permitted to enter the landfill; therefore exposure pathways for this receptor type are limited to airborne particulates and groundwater.



The contaminated soil will be placed on the surface of the existing landfill surface and covered with a minimum of 10 inches of clean fill and loam. The existing clay cap to the landfill prevents precipitation from settling further and clean fill, loam and seed prevent sediment from being transported off of the site.

Regular samples of groundwater are tested for contaminants under the existing Final Comprehensive Site Assessment (FSCA) monitoring plan. Possible harm to local residents caused by exposure to contaminated soil is very low.

#### Trespassers

Site access is not limited and trespassers frequent the site daily for recreational activities such as dog walks, running, sledding, and cross-country skiing.

Trespassers have a greater risk of possible harm caused by exposure to contaminants since as a group the average age ranges from 8 to 18 years. It is presumed that children have a greater risk of exposure to contaminants due to greater hand-to-mouth contact.

#### Public Health Sensitive Receptors

A review of Assessors information from the Town of Amherst shows that there are no schools, hospitals, nursing homes or preschool/daycare facilities within ½ mile of the Old Amherst Landfill. Therefore this receptor group is not evaluated in this Assessment.

#### Environmental Receptors

Environmental receptors at or surrounding the Old Amherst Landfill include aquatic and terrestrial biota and their habitats. Aquatic biota is located in Pomroy Pond. Terrestrial biota includes native wildlife and insects living in and around the Old Amherst Landfill and dependent upon its habitat.

#### Endangered Species

A letter from Natural Heritage and Endangered Species Program (Appendix E) lists the migratory grasshopper sparrow as an endangered species that uses the Old Amherst Landfill as a nesting area. The open, grassed areas of the Landfill are a priority habitat for this endangered species as indicated in Figure 1, Appendix E. A Massachusetts Endangered Species Application has been filed and the Town of Amherst is waiting for comments.

The construction phasing process described in the Application for Major Modification to Landfill (BWP SW 11) sets aside 1¾ acre parcels for regrading so that disturbance of this prime habitat is minimized. Each small section will be filled,





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covered and seeded before another section is disturbed. Some overlap from one area to the next must be expected to accommodate fill depths.

### Water Resources

Water resources at the Old Amherst Landfill considered as potential receptors are the surficial lowland aquifer that underlies the site (See FSCA, Section 4) and surface water. The aquifer gains protection by the existing clay cap for the closed landfill. A landfill closure monitoring program is in place to detect changes in leachate composition.

Surface water at Pomroy Pond could be considered a potential receptor under the MCP guidelines for a site-specific approach. However under the BUD guidelines for a use-specific approach, all contaminated soils will be placed on the existing surface of the landfill and covered with clean fill effectively encapsulating the contaminated soil thereby eliminating risk of infiltration to surface water.

Areas within the site mapped by MassGIS as wetlands or upland marshes are isolated and the result of settling of the landfill cap over time. [The purpose of the regrading proposal is to fill in depressed areas and to restore landfill cover slopes.] These areas are not included as potential receptors. There are no certified vernal pools at the Old Amherst Landfill.

## **SITE USES**

### CURRENT SITE ACTIVITIES AND USES

Until the capping procedure began in 1986, the site was used as a landfill, a recycling facility and an auto parts operation. Since final closure of the Old Amherst Landfill, the Town of Amherst has kept the site mowed and performed regular maintenance to the drainage system. During winter months, the Town uses the site for snow storage.

As mentioned previously, local residents can access the site by circumventing the fence that runs along a portion of the frontage on Old Belchertown Road. The Old Amherst Landfill has become a dog-walking location as well as an occasional seasonal location for cross-country skiing and winter sledding.

### FUTURE ACTIVITIES AND USES

The Town of Amherst received a proposal to use the site for passive generation of energy (solar panels) in response to Request for Proposal – Possible Reuse of the Town Landfill Sites in 2008. Although the Town seeks to increase its revenue by developing potential business opportunities, no contracts have been signed regarding any potential industrial activities at the Old Amherst Landfill. Potential human receptors are contractors involved in





the installation of solar panels and maintenance personnel. If solar panels are installed, the private contractor may need to construct a fence surrounding the panels for security purposes. In the event that the landfill site is never used for business purposes, there is no reason to expect that future use would change in character or quantity as it exists today.

#### ACTIVITY USE & LIMITATION

There is no Activity and Use Limitation on the site and there are no plans to implement an Activity and Use Limitation in the foreseeable future.

#### **GROUNDWATER CATEGORIES**

All residences surrounding the Old Amherst Landfill are supplied by the Town of Amherst public water supply with the exception of one private well located 500 feet to the east and upgradient of the landfill. No private wells are downgradient within ½ mile of the Old Amherst Landfill.

The landfill is contained within a Potentially Productive Medium Yield Aquifer as indicated by MassGIS Mapping Layers and therefore the site is classified as GW-1. Hydrogeological studies performed prior to the submission of the Final Comprehensive Site Assessment in January 2009, indicate that the site overlies a sand and gravel aquifer unit consisting of the surficial lowland aquifer and possibly a deeper confined aquifer. The boundary for the Zone II Wellhead Protection area for the current Town water supply extends to within 300 feet south of the landfill site. The site is not located within an Interim Wellhead Protection Area (*See Appendix A – Approved Zone II Areas*). Infiltration of contaminants to groundwater should be minimal as the contaminated soil will be placed on the existing surface of the capped landfill and covered with two to three feet of clean fill and loam.

#### **SOIL CATEGORIES**

Soil categorization is determined by the potential for exposure by receptors in combination with Site Activity and Use.

##### Frequency of Use

Access to the Old Amherst Landfill is not restricted and therefore it is presumed that children may be present on the site. Use of the site for dog-walking or sledding is not regular in type of activity or duration. Workers are assigned to the site infrequently and for short periods of time. Frequency of Use of the Old Amherst Landfill is characterized as low.

##### Intensity of Use



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No site activities or uses, current or future, involve disruption of the secondary material once it has been placed, graded, filled and loamed. During construction, there is potential for direct contact with soil or inhalation of soil-derived dust by construction workers. The overall Intensity of Use is characterized as low except during grading activities when Intensity of Use would be characterized as high.

### Accessibility

The secondary material covered in this Application for Beneficial Use shall be considered Potentially Accessible or Accessible. The contaminated soil containing arsenic will be covered with three feet or more of clean fill and loam. When the regrading project is complete, the soil shall be considered Potentially Accessible. The soil containing catch basin cleanings and street sweepings shall be considered accessible when regrading is finished as it will be covered with less than three feet of fill and loam.

### Summary

Soil contaminated with arsenic falls into the S-3 category and Street Sweepings and Catch Basin Cleanings fall into the S-2 category.

TABLE 6-1 SOIL CATEGORY MATRIX					
	Frequency of Use	Intensity of Use	Accessibility	Soil Category	Volume± (CY)
Soil Contaminated with Arsenic	Low	Low	Potentially Accessible	S-3	5,400
Street Sweepings and Catch Basin Cleanings	Low	Low	Accessible	S-2	62,270

## **EXPOSURE POINTS AND CONCENTRATION**

### EXPOSURE POINTS

Risks associated with contaminated drinking water or soils are evaluated using the MassDEP MCP (Massachusetts Contingency Plan) Method 3 ShortForm Version 6-06, Vlookup Version v0808. Potential drinking water contamination by the COCs addressed in this assessment is negligible. Only one private water supply well is located within 500 feet of the site and it is upgradient of the landfill. Drinking water around the landfill is supplied via the Town of Amherst public water utility. Infiltration of precipitation is prevented by the existing clay cap on the Landfill. Monitoring wells are in place and are regularly tested according to the schedule set forth in the Final Comprehensive Site Assessment.



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The *Supplemental Operation and Maintenance Plan – Section 7*, specifies how the contaminated soil is to be handled. It will not be left in open air for extended periods and will be covered with clean fill and loam. The COC's are not subject to volatilization and therefore will remain in the soil media. Although the concentrations of contaminants may exceed the regulatory thresholds throughout the media, exposure to high concentrations in large volumes of material will not occur.

### EXPOSURE POINT CONCENTRATION CALCULATION

Twelve soil samples were tested for arsenic from the location of the contaminated soil. Since the soil tested and discussed herein is at an orchard location, arsenic was found at all sample sites at various levels. The sample with the highest concentration of arsenic was 3.8 times as high as the next highest value and was statistically discarded as an outlier. A mean concentration was calculated to be 19.309 mg/kg. This concentration value was inserted into the MassDEP ShortForm Version 6-06, Vlookup Version 08-08. See Section 5 – Beneficial Use Determination for a more detailed explanation of the Exposure Point Concentration Calculation.

### EXPOSURE POINT CONCENTRATIONS

A BUD Method 3 use-specific risk assessment describes and quantifies the current and future exposure risks that would be attributable to the proposed beneficial use. Estimated risks are calculated using MassDEP ShortForm Version 6-06, Vlookup Version 08-08, and weighed against the Estimated Lifetime Cancer Risk and Noncancer Risk Limits specified in the BUD regulations.

Human exposure to contaminants is evaluated at three exposure pathways: inhalation, ingestion and dermal contact. Limited and specific use of contaminated soil as grading material that will be topped with clean fill and loam minimizes exposure to contaminated soil through inhalation and dermal contact to local residents. OSHA regulations require construction workers working with airborne and potentially hazardous materials to use facial protection. Trespassers will be protected from inhaling potentially harmful material by the very fact that they would not be present during construction when particulates could be airborne. A comparison of exposure to arsenic in soil at the mean concentration (calculated in Section 5) to the MassDEP background value of 20 mg/kg and the MassDEP Policy COMM 97-001 background value of 40 mg/kg is shown in the Exposure Point Concentration Table 6-2.





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**Table 6-2  
EXPOSURE POINT CONCENTRATIONS (mg/kg)**

Receptor	Mean Concentration 19,309 mg/kg			MassDEP MCP Background Value 20.00 mg/kg			MassDEP Policy COMM 97-001 Background Value 40.00 mg/kg		
	Subchronic HI	Chronic HI	ELCR	Subchronic HI	Chronic HI	ELCR	Subchronic HI	Chronic HI	ELCR
Park Visitor (IH)	3.03E-01		4.31E-06	3.13E-01		4.46E-06	6.27E-01		8.9245E-06
Park Visitor	3.03E-01	1.17E-01	8.52E-06	3.13E-01	1.22E-01	8.82E-06	6.27E-01	2.43E-01	1.7648E-05
Trespasser (IH)		2.76E-02	4.35E-07		2.85E-02	4.51E-07		5.71E-02	9.0208E-07
Trespasser	2.76E-02	1.30E-02	5.85E-07	2.85E-02	1.35E-02	6.06E-07	5.71E-02	2.69E-02	1.2122E-06
Construction Worker		3.93E-01	3.59E-07		4.07E-01	3.72E-07		8.14E-01	7.4467E-07

(IH) – Imminent Hazard

ELCR – Excess Lifetime Cancer Risk

Chronic and Subchronic Hazard Index – Noncancer Risk

Risks evaluated are based on ingestion and dermal contact



## ***RISK CHARACTERIZATION***

### **HUMAN HEALTH RISK CHARACTERIZATION**

A Method 3 Risk of Harm to Human Health is characterized for all current and reasonably foreseeable Site Activities and Uses. The site, receptor and exposure information is identified in previous paragraphs. The groundwater category for this site is GW-1 and soil categories are S-2 and S-3. Potentially applicable or suitably analogous standards include the Massachusetts Drinking Water Quality Standards (310 CMR 22.00), Massachusetts Air Quality Standards (310 CMR 6.00) and Massachusetts Surface Water Quality Standards (314 CMR 4.00). A conservative estimate of the potential exposures has been used to determine the frequency, duration and intensity of exposure to the secondary materials for each receptor at each Exposure Point. The Excess Lifetime Cancer Risks and Noncancer Risks have been calculated using the Massachusetts DEP ShortForm Version 6-06, Vlookup Version 08-08 and compared to the MassDEP MCP values and MassDEP BUDS guidelines. See Table 6-2.

Based on all of the above information, there is **No Significant Risk of Harm to Human Health** by placement of secondary material at the Old Amherst Landfill.

### **PUBLIC WELFARE RISK CHARACTERIZATION**

A Method 3 Risk of Harm to Human Health is characterized for all current and reasonably foreseeable Site Activities and Uses. Site, receptor and exposure information is identified in detail in previous paragraphs and includes site, human and environmental impacts of exposure to contaminants.

No nuisance conditions exist or have ever been documented at the site and no nuisance conditions are likely to occur due to deposition of contaminated soil at the Old Amherst Landfill.

Drinking water will not be affected by the deposition of contaminated soils and will, in the reasonably foreseeable future, remain free from noxious taste and odors; drinking water is supplied to local residents via the Town of Amherst public water system.

The Town of Amherst does not provide for an agriculture zoning district; therefore no land is zoned specifically for agriculture or livestock operations. However existing farmland is protected under the Farmland Conservation Resource Protection District Overlay. Any land covered by this protection is greater than one-half mile from the Old Amherst Landfill. Human Health and Environmental Risk Characterizations conducted for this site are also protective of livestock exposures.

No noxious odors were detected in the secondary material containing arsenic during field sampling and no odors are expected to occur during placement of that material. Street





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sweepings are not likely to generate odors. Placement of catch basin cleanings may cause some residents to detect unpleasant odors initially. These odors will not persist and are not harmful. The breathing zone of ambient and indoor air is currently and will, in the reasonably foreseeable future, remain free from persistent, noxious odors.

Based on all of the above information, there is **No Significant Risk of Harm to Public Welfare** by placement of secondary material at the Old Amherst Landfill.

### ENVIRONMENTAL RISK CHARACTERIZATION

Guidance provided by review of Method 3 Risk of Harm to the Environment parameters has been used to characterize ecological parameters. Site, receptor and exposure information previously identified, available data and research is evaluated to determine whether there is potential exposure of environmental receptors to contamination at the disposal site. See Section 3 for a detailed description of the existing conditions at Old Amherst Landfill.

The regrading project described in the Application for Beneficial Use Determination BUDS, for which this Risk Assessment is performed, has been specifically designed to minimize exposure to contaminated soil. The soil containing arsenic will be delivered to the site, placed in its permanent location and covered with two to three feet of clean fill and loam within 24 hours of delivery to the disposal site. Erosion will be prevented by seeding the loam with a native grass seed mix. The permanent location of this contaminated soil is on the existing engineered clay cap and turf cover. This design effectively encapsulates the contaminated soil and prevents leaching of precipitates into the soil. The Supplemental Operation and Maintenance Plan specifies that the contaminated soil will not be stockpiled on site.

#### Air

Properties of arsenic indicate that once it is bound in soil, it is not a volatile contaminant. The proposed regrading project includes cover of up to three feet on the contaminated soil. Contaminated particulate matter could become airborne if construction occurs in windy weather. The Supplemental Operation and Maintenance Plan specifies that if windy conditions exist such that suspended particulate matter is visible, deposition of contaminated soil will cease and be rescheduled.

In consideration of the necessity of proceeding with the regrading project to correct side slopes and ponding and limitations on construction given certain weather conditions, it can reasonably be concluded that there is **No Significant Risk of Harm to the Air** by placement of secondary material at the Old Amherst Landfill.

#### Earth Surfaces and Soil



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The soils and slopes of the Old Amherst Landfill will be changed by the proposed regrading project by the addition of contaminated soils and clean fill and loam for surface cover. Design of the proposed regrading allows for placement of arsenic-contaminated soil up to a thickness of two feet; two to three feet of clean fill and loam will be added over the contaminated soil. The thickness of the proposed cover and existing vector control by the Town of Amherst prevents potential access to the contaminated soil. Recommendations made in the Final Comprehensive Site Assessment point out that the Town of Amherst has adequately maintained this regulated site; however surface ponding threatens to cause surface runoff infiltration to the engineered barrier of the landfill.

In consideration of the necessity of proceeding with the regrading project to correct side slopes and ponding and prevention of access to the contaminated soil, it can reasonably be concluded that there is **No Significant Risk of Harm to the Earth Surfaces and Soils** by placement of secondary material at the Old Amherst Landfill.

### Water Resources

Water receptors previously listed include the surficial aquifer, Pomroy Pond and wetlands. Based on the engineered regrading proposal, there is no potential for infiltration of leachates to the surficial aquifer underlying the site, surface water at Pomroy Pond or runoff to the drainage system. Contaminated soil is scheduled to be placed and covered within 24 hours and if more than ½ inch of precipitation is forecasted, deposition will be rescheduled.

Potential for surface runoff to Pomroy Pond and to the drainage system is eliminated. Although airborne particulates could reach Pomroy Pond and the drainage system, if there is enough wind to create visible dust, deposition of contaminated soil will cease and be rescheduled as specified in the Supplemental Operation and Maintenance Plan.

MassGIS mapping indicates wetland areas on the landfill surface – these wetlands have been created due to surface ponding that the proposed regrading project has been designed to remediate. Although these wetland areas are possible receptors, they were not part of the original landfill capping process and risk degrading the capped landfill system.

Considering 1) the necessity of proceeding with the regrading project to correct side slopes and ponding, 2) the minimal amount of time that the contaminated soil will be exposed to the air at the site, 3) the design and construction procedures to be followed in regarding the landfill; and 4) incomplete exposure pathways, it can reasonably be concluded that there is **No Significant Risk of Harm to Water Resources** by placement of secondary material at the Old Amherst Landfill.



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### Aquatic Biota and Habitat

Aquatic biota at the Old Amherst Landfill is found at Pomroy Pond. Although potential exposure to contaminants by various aquatic organisms exists by air pathway, limitations on construction schedule and procedure and specific weather conditions protect against chronic exposure. There is no current direct discharge of contaminants to the pond and construction procedures prevent potential discharge.

Research on the impact of arsenic in aquatic environments is ongoing. Some organisms tolerate arsenic well and metabolize it effectively. Certain arsenical species inhibit aquatic plant growth while other species promote plant growth. Other organisms are less efficient in processing arsenic. Ability of organisms to metabolize and release arsenic is dependent on concentration, arsenic speciation, salinity, temperature, alkalinity, diet, organic content, phosphate content, presence of other substances and toxicants, and duration of exposure.

The pond is flanked on the west by a ten-foot high berm that prevents surface runoff from entering the pond. Groundwater contouring provided by Tighe & Bond Consulting Engineers, Westfield, MA, in the FSCA, shows that the general flow of groundwater is from east to west. Since the pond is situated on the eastern boundary of the landfill, groundwater in the landfill flows westerly away from the pond.

Considering 1) the necessity of proceeding with the regrading project to correct side slopes and ponding at the landfill, 2) the topography that directs surface runoff and groundwater contouring, and 3) incomplete exposure pathways, it can reasonably be concluded that there is **No Significant Risk of Harm to Aquatic Biota** by placement of secondary material at the Old Amherst Landfill.

### Terrestrial Biota and Habitats

Animals may be exposed through direct contact with contaminated soil, incidental ingestion of contaminated soil and ingestion of contaminated food. Plants may be exposed by uptake of contaminants in soil moisture. Forage plants grown in soils contaminated with arsenical orchard pesticides contained high levels of arsenic but were not considered hazardous to grazing ruminants. Domestic animals are more likely to succumb to arsenicosis than wildlife.

Numerous criteria have been proposed to protect natural resources from contamination by anthropogenic arsenic; however most authorities agree that more data is required. Metabolism and effect of arsenic is significantly influenced by the organism tested and early stages of life are more susceptible to acute toxic effects.



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Terrestrial Biota at the Old Amherst Landfill includes organisms such as small mammals, insects, birds and plants that depend on the established habitat at the Landfill. A detailed site description is set forth in Section 3 of this submission. Generally, the landfill is 52± acres of open, grassed area on top of the clay cap constructed in 1988. It is surrounded by wooded areas and residential development and a pond.

### Terrestrial Biota

Construction practices enumerated in the Supplemental Operation and Maintenance Plan prevent exposure to contaminated soil by terrestrial biota through any pathway since the contaminated soil will be covered with up to three feet of clean fill. Although burrowing mammals such as groundhogs have been discovered at the landfill occasionally, their burrows are filled in by Town of Amherst employees to protect the integrity of the clay cap.

Complete exposure pathways will not exist, therefore there is **No Significant Risk of Harm to the Terrestrial Biota** by placement of secondary material at the Old Amherst Landfill.

### Plants

The landfill is mowed annually by Town of Amherst employees and all woody growth is removed to prevent roots from penetrating the clay cap of the landfill. Native grasses with root systems from 4 to 6 inches are proposed for reseeding each area that is to be regraded in the proposed construction. Although arsenic availability to plants is highest in coarse-textured soils, three feet of clean fill between the surface and contaminated soil provides ample room for plantings to establish root systems without contact to the contaminated soil. Plants can only absorb arsenic when arsenic is mobilized in soil. For arsenic to be mobilized in soil, it must be in a soil solution. The arsenic soils will be situated more than three feet under the surface and therefore arsenic will not become solubilized.

Complete exposure pathways will not exist, therefore there is **No Significant Risk of Harm to the Plants** by placement of secondary material at the Old Amherst Landfill.

### Endangered Species

This site is also set aside as primary habitat for the Massachusetts State Listed Endangered Species, the Grasshopper Sparrow, *Ammodramus savannarum*. See Appendix E, Natural Heritage and Endangered Species Program, for documentation. The Grasshopper Sparrow eats, nests and sleeps on the ground. In addition to grasshoppers, the grasshopper sparrow also eats spiders, myriapods, snails,





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earthworms and weeds and grass seeds. Ideal habitat consists of hayfields or sandplain grasslands characterized by bunch grasses and bare patches of soil.

Research has shown that tolerance of arsenic varies greatly among avian species. Avian arsenic toxicity has been studied primarily in the mallard duck and poultry. Some species, such as mallard ducks, rapidly eliminate certain arsenical compounds. Elevated levels of arsenic rarely occur naturally in eggs. In fact, arsenic in poultry feed has been shown to increase egg production and stimulate growth.

The U.S. Environmental Protection Agency developed Ecological Site Screening Levels (Eco-SSL) of environmental contaminants. It is presumed that the Eco-SSL values provide conservative protection to terrestrial biota. Ecological Site Screening Levels are intended to be applied to the screening phase of a risk assessment to determine if further evaluation is necessary. Three trophic groups were evaluated: the herbivorous dove, insectivorous woodcock and carnivorous hawk (*See Appendix E*). Of interest herein is the insectivorous, ground-feeding woodcock. The Eco-SSL value for the woodcock is 43 mg/kg (dry weight). This research may indicate that certain ground-feeding insectivorous avian species may be able to tolerate concentrations of arsenic up to 43 mg/kg (dw).

In any event, there will be no surface concentrations of arsenic due to the engineering and sequence of construction for the regrading project using contaminated soil. The Grasshopper Sparrow and all other avian species using the site will not have access to the contaminated soil. Complete exposure pathways will not exist, therefore there is **No Significant Risk of Harm to the Endangered Species** by placement of secondary material at the Old Amherst Landfill.

### Environmental Risk Characterization Conclusion

Exposures of site biota and habitats have been evaluated to determine whether there is current or potential future exposure of Environmental Receptors to contamination at or from the disposal site. Sources of evidence include site data, field observations, and toxicological data. For all of the potential Environmental Receptors included in this Assessment (Air, Water, Soil, Terrestrial and Soil Biota and Habitats), there is **No Significant Risk of Harm to the Environment** by placement of secondary material at the Old Amherst Landfill.

### **UNCERTAINTIES**

Levels of contaminants in typical street sweepings and catch basin cleanings are considered by MassDEP to be low enough that their disposal in a regulated system is not considered a significant risk. Actual levels of the most likely contaminants, total petroleum hydrocarbons

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and polynuclear aromatic hydrocarbons, are unknown. Therefore, calculations to determine exposure point concentrations did not include these constituents.

Creation of an accurate overview of the type and concentration of contaminants in a specific location is limited by testing procedures, the number of samples tested and professional analysis of the data. In the case of the Atkins Corner soils, testing for Arsenic was the appropriate contaminant to test for since the site had long been used for agricultural purposes. QA/QC protocols were followed in conjunction with adherence to the U.S. EPA testing standards for laboratory testing. A greater number of samples to tested increases the reliability of the contaminant concentration.

Soil testing for arsenic determined its presence not its chemical form. Toxicity of different chemical forms of arsenic may vary widely so simple elemental analysis may not be sufficient to characterize the risk posed by contamination.

Not enough data exists to determine loss of ecological function due to exposure to COCs; however a reasonable conclusion is that it is unlikely. Environmental receptors will be prevented from exposure to COCs by the top soil and loam cover. None of the COCs pose a threat to the environmental receptors via upward migration to the surface.

### CONCLUSION

The proposed regrading project submitted in the **APPLICATION FOR MAJOR MODIFICATION TO LANDFILL (BWP SW 11)** has been specifically designed to first accept the most contaminated soil for application and deepest deposition of secondary material at the Old Amherst Landfill. Thickness of the arsenic contaminated soil shall not exceed two feet. Subsequent applications of street sweepings and catch basin cleanings will be deposited to bring elevations to ten inches below the proposed final grade. Clean fill and loam will follow to protect public health, safety and welfare and the environment and to meet designed grading elevations

If the concentration of an oil and/or hazardous material at the disposal site is at or below background levels, then that oil and/or hazardous material shall be considered to pose **No Significant Risk 310 CMR 40.0902(3)**. Arsenic is a stable, relatively immobile compound and does not degrade readily. The existing clay cap cover will inhibit infiltration of precipitation into the impacted soils. Therefore, the chemical characteristics of arsenic and the presence of the cap will prevent mobilization of the arsenic. Recommended background levels for arsenic will be achieved at the Atkins Corner site and deposition of the contaminated soil at the Old Amherst Landfill poses **No Significant Risk of Harm to Human Health, Public Welfare and the Environment**.

This application constitutes abatement of the development of an Imminent Hazard to human health and the environment by removal of the contaminated soil to a protected and





## *SECTION 6 RISK ASSESSMENT*

regulated location. Disposal of the contaminated soil at the Old Amherst Landfill from the Atkins Corner site is expeditious and cost-effective. The requirements set forth in 310 CMR 19.00 and MassDEP Policy #COMM 97-001 for reuse of contaminated soil at unlined landfills are met by this submission.







**Town of Amherst  
Department of Public Works**

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**SECTION 10**

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**BWP SW 11 Landfills Major Modification Permit  
(Section 7 Supplemental Operation and Maintenance Plan)**

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## SECTION 7 SUPPLEMENTAL OPERATION AND MAINTENANCE PLAN

### **SUPPLEMENTAL OPERATION AND MAINTENANCE PLAN**

#### **INTRODUCTION**

This Supplemental Operation and Maintenance Plan is submitted to address activities related to the reuse of Contaminated Soil and Secondary Material for grading material at the Old Amherst Landfill. In addition to the minimum required post-closure activities set forth in **310 CMR 19.143** and based on prior management and operational experience, the Town of Amherst has developed additional routine maintenance activities and inspections.

#### **GENERAL**

Procedures and practices shall be incorporated in accordance with approved plans and permit conditions, such as proper sequencing of landfill operations, proper grading of the site, proper maintenance of drainage and collection systems, and the application of adequate amounts and appropriate types of cover materials, which will prevent pollution of ground water, surface water and air quality and prevent nuisance conditions from developing.

The overall care, maintenance and responsibility for the Old Amherst Landfill shall be under the direction of the Town of Amherst Department of Public Works, a qualified operator.

The following procedures shall be followed when managing Contaminated Soil or Secondary Materials at a Massachusetts landfill.

#### **LANDFILL OPERATIONS DURING CONTAMINATED SOIL DEPOSITION**

All Contaminated Soil or Special Wastes to be received by the Old Amherst Landfill shall be handled in accordance with conditions specified by the Massachusetts Department of Environmental Protection pursuant to the **APPLICATION FOR MAJOR MODIFICATION and APPLICATION FOR BENEFICIAL USE DETERMINATION** submitted herein and in accordance with the handling provisions of **310 CMR 19.061**.

No material subject to **Hazardous Waste Regulations, 310 CMR 30.000**, shall be accepted at the Old Amherst Landfill. The Town of Amherst Department of Public Works shall immediately notify the Massachusetts Department of Environmental Protection and the Amherst Board of Health of the discovery of any material subject to **310 CMR 30.000 Hazardous Waste**.

No Bulky Wastes are to be accepted at the Old Amherst Landfill.

No Liquid Wastes are to be accepted at the Old Amherst Landfill.

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Landfill Operation Practices

- (a) When Contaminated Soil is used as cover material, the standards in for cover material in **310 CMR 19.130(15)** shall be met, including the requirement that the cover material be substantially odor free.
- (b) Unlined landfills that accept Contaminated Soil for use as cover and/or capping contour material shall have in place Department approved erosion control and excavate placement plans. In addition, unlined landfills that accept Contaminated Soil for use as fill material shall have a Department approval specifying the quantity of Contaminated Soil to be stockpiled for use as fill material.
- (c) Fill material or other reuse materials which contain Contaminated Soil shall be applied within 90 days of receipt at the facility.
- (d) Preventative maintenance shall be employed to ensure that the Contaminated Soil, whether stockpiled or applied to the landfill, does not erode into the area between the operating footprint of the landfill and the property boundary.
- (e) Fugitive dust levels shall be kept to a minimum through the use of Best Management Practices. Contaminated Soil shall be prohibited from use on haul roads or other areas used for vehicle or truck traffic.
- (f) Stockpiling of Contaminated Soil at unlined landfills shall be restricted to areas above the existing landfill footprint.
- (g) Contaminated Soil shall have no free draining liquids.
- (h) The Contaminated Soil shall be free of solid waste (e.g. construction and demolition debris or other putrescible matter).
- (i) Temporary vegetative cover will be established for areas of exposed soils (including stockpiles) where construction will cease for more than 14 days.
- (j) Redefinition of existing grass swales and rip-rap swales will take place without disturbing the existing landfill clay cap.





## SECTION 7 SUPPLEMENTAL OPERATION AND MAINTENANCE PLAN

### Secondary Material Handling

- (a) Secondary material shall not be deposited in, or be allowed to enter surface or ground waters of the Commonwealth.
- (b) Secondary material shall not be unloaded unless the operation is under the direct supervision of the operator.
- (c) The deposition of the Contaminated Soil shall be confined to the smallest area feasible.

### Equipment And Equipment Shelter

The operator shall provide equipment in adequate numbers and of appropriate type and size to ensure adequate compaction of fill materials and the proper maintenance of the facility.

Equipment shall not be in direct contact with the drainage/protection layer during landfilling activities.

### Staffing

The operator shall provide an adequate number of trained staff to ensure that the modifications to the existing landfill set forth in the **APPLICATION FOR MAJOR MODIFICATION TO LANDFILL (BWP SW 11)** are conducted in accordance with the approved Site Plan.

The operator shall be continuously present when secondary material is delivered to the Old Amherst Landfill.

### Spreading and Compacting of Fill Materials

All Secondary Material and Contaminated Soil shall be evenly spread in shallow layers not exceeding three feet in thickness prior to compaction.

Each layer shall be thoroughly compacted prior to the spreading and compaction of each additional layer.

### Cover Material

All cover material shall:

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- (a) Control fires, vectors, the occurrence of nuisance conditions such as odors, dust or litter, and be placed in a manner so as to minimize erosion by wind and/or water;
- (b) Maintain a physical separation of the Secondary Material or Contaminated Soil from the surface environment;
- (c) Be substantially odor free;
- (d) Consist of materials suitable for carrying out the geotechnical and other functions of the cover material; and
- (e) Be free of substances which would attract vectors and free of large object which would hinder spreading and compaction or otherwise interfere with the proper functions of cover mater.

Intermediate Cover

Intermediate cover material shall be used to prevent or minimize the infiltration and percolation of water into the landfill and shall be applied under the following circumstances:

A minimum of six inches of uniformly compacted intermediate cover, in addition to the daily cover, shall be applied on the exterior top and side slopes of any filled areas of a landfill which has not received or will not receive Secondary Material or Contaminated Soil for 30 days; or

A minimum of one foot of uniformly compacted intermediate cover shall be applied on the exterior top and side slopes of any filled areas of a landfill which has not or will not receive Secondary Material or Contaminated Soil for six months or longer.

Final Cover

The application of final cover shall begin to be applied to a section of the landfill as soon as possible, but no later than 90 days after the following circumstances:

- (a) Whenever a new lift has not or will not be applied within a one-year period unless the area is permitted to accept additional Secondary Material or Contaminated Soil;
- (b) Upon reaching final approved elevations;



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- (c) Whenever a phase of the landfill has been completed; or
- (d) Whenever the permit expires or terminates for any reason, or is revoked.

The final cover shall be designed and constructed in accordance with the requirements established in **310 CMR 19.112, 19.113 or 19.114**.

Final cover shall be maintained to prevent erosion and ensure the integrity of the cap.

### Maintenance of Intermediate or Final Cover

The final cover system shall be repaired immediately upon the detection of any failure which may result in the release of pollutants to the environment and shall be maintained and repaired during the active life of the landfill, the closure period and the post-closure period.

Operators shall repair the intermediate cover, including cover vegetation if used, of all areas on which intermediate cover has been applied.

### Vector, Dust And Odor Control

The operator shall prevent vectors, dust, odors and other nuisance conditions from developing at the landfill.

No pesticides shall be utilized.

Water shall not be used for dust control in amounts which produce excessive infiltration, ponding or erosion.

### Top Slope And Side Slopes

The operator shall ensure that:

- (a) The final top slope has a minimum grade of 2%;
- (b) No top slope or side slope grade shall result in excessive erosion; and
- (c) Final exterior slide slopes shall not exceed a slope of two horizontal to one vertical (2:1).

In no case shall an unstable slope be created or a slope that could result in abnormal stress on the liner system.



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Storm Water Drainage

The operator shall provide sufficient stormwater drainage controls and diversion structures, channels or ditches to promote drainage off of the landfill, minimize run-on onto the landfill, prevent uncontrolled ponding on the landfill or uncontrolled ponding adjacent to the filled area.

Stormwater drainage structures shall be designed, constructed and maintained so as to ensure integrity of the drainage structures and so as to prevent erosion of the landfill.

Erosion Control

The operator shall institute such soil erosion control measures as are necessary to ensure the retention and integrity of the daily, intermediate or final cover.

The operator shall ensure that no Secondary Material or Contaminated Soil or leachate is carried off-site due to erosion.

The operator shall ensure that siltation due to erosion shall not migrate off-site.

In a situation where significant settlement, uncontrolled ponding of waters or erosion of the landfill or cover material placed over the landfill occurs during the operation, closure or the post-closure period, the operator or owner shall immediately institute corrective measures.

Phased Completion Of The Landfill Modification

Landfill operations shall be conducted in phases in accordance with approved plans to reduce the amount of active area exposed.

Final cover shall be placed on completed phases and shall be maintained to prevent erosion and ensure the integrity of the cap.

Disruption Of Landfilled Areas

No person shall excavate, disrupt or remove deposited material from either an active, inactive, or closed landfill without prior written approval from the Department.

All requests for approval shall be submitted to the Department in accordance with **310 CMR 19.00**.

Records for Operations and Plan Execution

The operator is currently required to submit an annual report summarizing all activities at the Old Amherst Landfill. All annual reports submitted after approval of the **BWP SW**



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**11 Major Modification to Landfill** and **BWP SW 40 Beneficial Use Determination** shall include the following information:

- (a) Type of Secondary Material or Contaminated Soil delivered to the Old Amherst Landfill;
- (b) Estimates of the total weight and volume of waste delivered based upon the capacity of the vehicles which deliver waste;
- (c) Amount of capacity remaining at the Landfill;
- (d) Volume of cover material applied; and
- (e) Status of all environmental control or monitoring systems.

**REQUIRED MAINTENANCE PROGRAM**

The following minimum activities are required to perform routine maintenance at a Massachusetts landfill as set forth in **310 CMR 19.143**:

- (a) Cutting vegetation over the entire landfill, at a minimum frequency of once per year to prevent the establishment of deep-rooted vegetation;
- (b) Semi-annual inspection for settlement and erosion;
- (c) Semi-annual inspection of stormwater drainage swales and retention basins for soil build up and periodic cleaning as necessary;
- (d) Repairs of the landfill cap, stormwater structures, or other landfill appurtenances; and
- (e) Maintenance of the access road such that the road remains passable to maintenance/repair vehicles.

All maintenance/repair of final cover system components or associated landfill appurtenances conducted as a result of storm damage, erosion, or other circumstances shall be summarized and reported by the Town to the MassDEP.

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**ROUTINE MAINTENANCE ACTIVITIES AND INSPECTIONS**

Routine maintenance and inspections activities shall be performed for the following items.

**Vegetation**

*Description:* The vegetative grass cover on the landfill shall be monitored and maintained to ensure stormwater runoff quality, provide slope stabilization and limit the potential for erosion due to wind and stormwater runoff.

<i>Maintenance and Inspection:</i>	<p>Inspect landfill surface for signs exposed soil, rills and gullies. Repair any rills and gullies. Replace dead vegetation.</p> <p>Frequency - First few months after installation of additional fill material and twice a year thereafter.</p> <p>Mow – Once a year starting September 1<sup>st</sup>. (No mowing shall take place during the breeding season of the Grasshopper Sparrow, between May 1<sup>st</sup> and August 31<sup>st</sup>)</p> <p>*Reseed - As necessary.</p>
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*Responsible Staff:* Amherst Department of Public Works

\*Landfill Surface Vegetation

All disturbed areas, with the exception of the service road and rip-rap swales, shall receive a minimum of 4" of sandy top soil. Lime shall then be applied at a rate of 50LBS per 1000 SF followed by an application of 10-20-100 fertilizer at a rate of 30LBS per 1000 SF. The disturbed areas shall then be seeded with 'New England Warm Season Grass Mix' supplied by New England Wetland Plants, Inc. 820 West Street, Amherst, Ma. (413) 584-8000.

This seed mix is a combination of the following grasses:

*Andropogon gerardii*, Big Bluestem;  
*Elymus virginicus*, Virginia Wild Rye;  
*Festuca rubra*, Creeping Red Fescue;  
*Panicum virgatum*, Switch Grass;  
*Schizachyrium scoparium*, Little Bluestem; and  
*Sorghastrum nutans*, Indian Grass.

After the seed mixture is spread, the areas may be mulched with straw at the rates of 40LBS per 1000SF for slopes less than 3:1 and 70LBS per 1000SF for slopes greater than 3:1.





## SECTION 7 SUPPLEMENTAL OPERATION AND MAINTENANCE PLAN

### Final Fill Cover

*Description:* The integrity of the final fill cover shall be monitored and inspected to ensure that its ability to shed stormwater runoff has not been reduced or that its function as a physical barrier over contaminated soil or the clay cap has not been jeopardized.

<i>Maintenance and Inspection:</i>	<p>Inspect final landfill cover for signs of settlement, subsidence, ponding and/or surface grades of less than 2% slope. Fill depressions with additional fill material to promote positive drainage. Loam and reseed any new or damaged fill areas surface.</p> <p>Frequency – Annually</p> <p>Inspect final landfill cover to make sure vegetation is adequate and for signs of rills and gullies. Repair any rills and gullies. Replace dead vegetation.</p> <p>Frequency - First few months after installation of additional fill material and twice a year thereafter.</p> <p>Mow – Once a year starting September 1<sup>st</sup>. (No mowing shall take place during the breeding season of the Grasshopper Sparrow, between May 1<sup>st</sup> and August 31<sup>st</sup>.)</p> <p>Reseed - As necessary.</p>
<i>Responsible Staff:</i>	Amherst Department of Public Works

### Clay Cap

*Description:* The clay cap layer shall be monitored and inspected to ensure the integrity of the cap is maintained.

<i>Maintenance and Inspection:</i>	<p>Inspect clay cap for signs of excessive settlement, substandard performance, physical damage or exposure. Notify Town Engineer for preliminary assessment of damage, determine action required.</p> <p>Frequency – Annually</p>
<i>Responsible Staff:</i>	Amherst Department of Public Works

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**Grass Swales (Stormwater Drainage System)**

*Description:* The existing stormwater system located on the site was designed and sized as part of the Amherst Sanitary Landfill Close-Out Project dated 1986. The existing grass swales shall be monitored and inspected to ensure they function as original designed.

<i>Maintenance and Inspection:</i>	<p>Inspect swales to make sure vegetation is adequate and for signs of accumulation of sediments, rills and gullies. Repair any rills and gullies, redefine or regrade as needed. Replace dead vegetation.</p> <p>Frequency – First few months after installation of additional fill material and twice a year thereafter.</p> <p>Mow – As necessary. Grass height shall not exceed 6".</p> <p>Remove sediments and debris.</p> <p>Frequency – At least once a year.</p> <p>Reseed - As necessary.</p>
<i>Responsible Staff:</i>	Amherst Department of Public Works

**Rip-Rap Swales (Stormwater Drainage System)**

*Description:* The existing stormwater system located on the site was designed and sized as part of the Amherst Sanitary Landfill Close-Out Project dated 1986. The existing rip-rap swales shall be monitored and inspected to ensure that they function as originally designed.

<i>Maintenance and Inspection:</i>	<p>Inspect swales to make sure rip-rap is stabile and adequate. Check for signs of accumulated sediments, rills and gullies. Repair any rills and gullies, redefine and add additional rip-rap. Frequency - First few months after installation of additional fill material and twice a year thereafter.</p> <p>Remove sediments and debris.</p> <p>Frequency – At least once a year.</p> <p>Install additional rip-rap - As necessary.</p>
<i>Responsible Staff:</i>	Amherst Department of Public Works



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**Stormwater Basins, Drop Inlet, Drainage Pipes**  
**(Stormwater Drainage System)**

*BMP Description:* The two existing stormwater basins and associated drop inlet and drainage pipes located on the site were designed and sized as part of the Amherst Sanitary Landfill Close-Out Project dated 1986. The drainage system components shall be monitored and inspected to ensure that they function as originally designed.

<i>Maintenance and Inspection:</i>	<p>Inspect surface drainage control for evidence of damage, excessive erosions, settlement and obstructions and debris. Frequency - At least twice a year and immediately after major storm events (storms that produce 0.5 inch of rainfall or greater)</p> <p>Inspected outlet pipe for evidence of clogging or damage. Frequency - At least twice a year.</p> <p>Mow side slopes, embankments and emergency spillway. Frequency - At least twice a year.</p> <p>Remove trash and debris from basin and outlet. Frequency - At least twice a year.</p> <p>Remove sediments and regrade basins. Frequency – At least once every 5 year.</p>
<i>Responsible Staff:</i>	Amherst Department of Public Works

**Monitoring Wells**

*Description:* The gas vents and groundwater wells shall be monitored and inspected to ensure they are secure, do not show signs of damage and function as designed.

<i>Maintenance and Inspection:</i>	<p>Inspect monitoring wells for signs of excessive settlement or physical damage. Notify Town Engineer for preliminary assessment of damage, determine action required. Frequency – Annually</p> <p>If landfill surface grade needs to be adjusted in the vicinity of the gas vents, add additional PVC pipe to vent. Top of vent shall be raised 18" above finished grade.</p> <p>Protect vents during all grading and mowing operations.</p>
<i>Responsible Staff:</i>	Amherst Department of Public Works



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Access Controls and Access Roadway

*Description:* All locks, gates, signs, fences and access roadways shall be monitored and inspected to ensure they are secure and limit access to the site.

<i>Maintenance and Inspection:</i>	Inspect all locks, gates, signs and fences for indications of damage due to vandalism, trespassing or natural wear. Repair or replace items as needed. Frequency – Monthly
	Inspect access roadway for damage due to vehicle use. Add additional trap rock material and regrade as needed.

<i>Responsible Staff:</i>	Amherst Department of Public Works
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Litter

*Description:* The landfill site shall be monitored and inspected for accumulation of litter and debris.

<i>Maintenance and Inspection:</i>	Inspect landfill site (interior and perimeter of site) for accumulated litter and debris. Collect and remove off-site. Frequency – Monthly
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<i>Responsible Staff:</i>	Amherst Department of Public Works
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**SECTION 7**  
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**LANDFILL POST-CLOSURE SITE INSPECTION REPORT**

GENERAL INFORMATION						
<b>Facility Name</b>	Old Amherst Landfill					
<b>Location</b>	Old Amherst Landfill, Old Belchertown Rd. Amherst, Ma.					
<b>Date of Inspection</b>		<b>Start/End Time</b>				
<b>Inspector's Name(s)</b>						
<b>Inspector's Title(s)</b>						
<b>Inspector's Contact Information</b>	Town of Amherst Department of Public Works 586 South Pleasant St. Amherst, Ma. 01002      Phone 413-259-3050					
<b>Is facility under any Enforcement Action?</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No					
WEATHER INFORMATION						
<b>Has there been a storm event since the last inspection?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>If yes, provide:</b> Storm Start Date & Time:      Storm Duration (hrs):      Approximate Amount of Precipitation (in):						
<b>Weather at time of this inspection?</b> <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Sleet <input type="checkbox"/> Fog <input type="checkbox"/> Snowing <input type="checkbox"/> High Winds <input type="checkbox"/> Other:      Temperature:						
SITE FEATURES						
If damage is present, indicate if damage is Minor or Major (Minor damage= no immediate repair needed, but should be repaired or watched during the year) (Major damage= requires immediate repair and submittal of a work scope to conduct repair)						
	Site Access	Damage		Minor	Major	Notes
1	Is there adequate access control to ensure site is secure?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
2	Are all locks in good conditions?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
3	Are perimeter warning signs present?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			

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4	Is the access road (s) in good condition?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
5	Other observations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
	<b>Litter</b>	<b>Damage</b>		<b>Minor</b>	<b>Major</b>	<b>Notes</b>
6	Is litter and debris collected and removed from perimeter of site?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
7	Is litter and debris collected and removed from interior of site? (including stormwater basins)	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
8	Other observations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
	<b>Monitoring Wells</b>	<b>Damage</b>		<b>Minor</b>	<b>Major</b>	<b>Notes</b>
9	Are all gas vents in good physical condition with no signs of damage?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
10	Has settlement of landfill surface occurred around wells?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
11	Are all the groundwater monitoring wells in good conditions?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
12	Other observations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
	<b>Stormwater Drainage System</b>	<b>Damage</b>		<b>Minor</b>	<b>Major</b>	<b>Notes</b>
13	Are all grass swales free of sediments?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
14	Are swales in good physical condition with no signs of erosion or damaged/weakened vegetation?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
15	Has any settlement occurred in the swales resulting in ponding of water within the swale?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
16	Are the swales mowed sufficiently?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
17	Are all rip-rap swales free of sediments?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
18	Are swales in good physical condition with no signs of erosion or damaged/shifting of the rip-rap?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			





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19	Has any settlement occurred in the swales resulting in ponding of water within the swale?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
20	Is there any evidence of clogging or damage at drain pipe inlets or outlets?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
21	Is there any evidence of damage, excessive erosion, damaged/weakened vegetation or settlement of the stormwater basins?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
22	Are all basins free of sediments?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
23	Are side slopes, embankments, and emergency overflows mowed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
24	Is there any evidence of damage, excessive erosion or settlement of the drop inlet?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
25	Other observations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
	<b>Clay Cap</b>	<b>Damage</b>		<b>Minor</b>	<b>Major</b>	<b>Notes</b>
26	Is there any evidence of excessive settlement, substandard performance, physical damage or exposure? (If yes notify Town Engineer)	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
27	Other observations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
	<b>Final Fill Cover/Landfill Surface</b>	<b>Damage</b>		<b>Minor</b>	<b>Major</b>	<b>Notes</b>
28	Is there any evidence of settlement, subsidence, ponding and /or surface slopes less than 2%?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
29	Is there any evidence of damage, excessive erosion, damaged/weakened vegetation?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
30	Is there any evidence of damage from burrowing animals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
31	Other observations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			

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	Vegetation	Damage		Minor	Major	Notes
32	Is there evidence of damaged/weakened vegetations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
33	Are there any signs of excessive erosion, exposed soil, rills or gullies?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
34	Is the landfill surface sufficiently mowed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			
35	Other observations?	<input type="checkbox"/> Yes	<input type="checkbox"/> No			

**Non-Compliance**

Describe any incidents of non-compliance not described above:

**CERTIFICATION STATEMENT**

"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. "

Print name and title: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



**Town of Amherst  
Department of Public Works**

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**SECTION 11**

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**Site Plans and Details (six sheets)**

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